How to take better Kodachrome pictures

35¢

a Kodak
publication about
color slides

How to take better Kodachrome pictures

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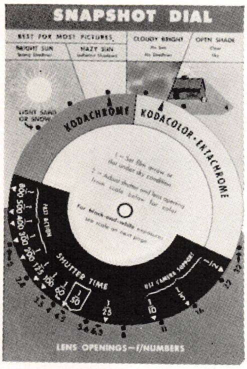
Introduction

Easy Does It

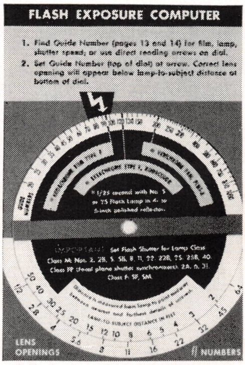
Snapshooting with Kodachrome film is pretty much the same as snapshooting with black-and-white film. You go through the same motions, but you pay more attention to the way the subject is lighted.

The ideal picture-taking method is a simple one: aim and shoot. You can come close to the simplicity of this popgun method by adjusting the camera for the picture situation you meet most often. With this basic setting, you can aim and shoot as long as the situation fits the conditions of lighting and subject type.

But, a good picture is a target somewhat more elusive than the broad side of a barn. Interesting picture material



You turn the dial to place the Subject Type pointer for Kodachrome Film at the Sky Condition. Now the two scales at the bottom are in position for reading shutter speeds and lens openings.


FLASH EXPOSURE COMPUTER
1. Find Guide Number (pages 13 and 14) for film, lamp, shutter speed; or use direct reading arrows on dial.
2. Set Guide Number (top of dial) at arrow. Correct lens opening will appear below lamp-to-subject distance at bottom of dial.
GUIDE NUMBERS
LENS OPENINGS
f/ NUMBERS

You turn the dial to place the Exposure Guide Number at the arrow. The scales at the bottom show the lens opening for whatever flashing distance you choose. A table of Guide Numbers is included.

isn't always co-operative about meeting the basic conditions. It sometimes picks a time, a place, or a weather condition that needs a change in camera setting. What change do you make?

The handiest source of this information is an exposure guide. The three guides illustrated below are part of the Kodak Master Photoguide, a booklet of complete on-the-spot picture-taking information for pictures with black-and-white and color films. The outdoor and flash guides are also available in the form of a separate guide, the Kodaguide Snapshot Dial.

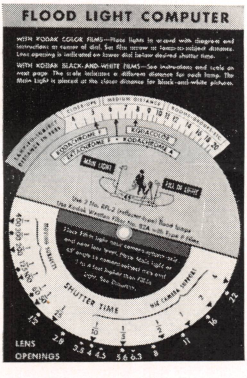
With a few good rules of thumb and a clear idea of a bare few of the principles involved, you will be able to make most of your exposures without a guide. This booklet is written to help you reach that goal.

What Is Kodachrome Film?

The Kodachrome film we talk about in this booklet is a film for miniature cameras. With it you get color transparencies measuring about 1 by 1½ inches. Processing is handled through your Kodak dealer, and the transparencies are returned to you mounted individually in 2-inch-square cardboard mounts. These are ready for projection in a slide projector or in a viewer. If you are interested in color prints from the transparencies, you can have these, too. You'll find details on page 31.

There are two sizes of Kodachrome film for miniature cameras: Kodak 828 rolls (8 exposures) for Kodak Pony and Bantam cameras, and Kodak 135 magazines (20 or 36 exposures) for cameras using 35mm film. Either roll of 135 film can be used in a stereo camera. The 20-exposure size gives 15 stereo pairs and the 36-exposure size, 28.

There are two types of Kodachrome film, and there's an important difference between them. Kodachrome Film, Daylight Type, is for use in daylight, and Kodachrome Film, Type F, is for use with clear flash lamps or photoflood lamps.



FLOOD LIGHT COMPUTER

WITH KODAK COLOR FILMS—Place lights in accord with diagram and instructions at center of dial. Set film arrow at lamp-to-subject distance. Lens opening is indicated on lower dial below desired shutter time.

WITH KODAK BLACK-AND-WHITE FILMS—See instructions and scale on next page. The scale indicates a different distance for each lamp. The Main Light is placed at the closer distance for black-and-white pictures.

You turn the dial to place the Kodachrome Film arrow at the distance in feet separating subject and flood lamps. The scales at the bottom show the lens and shutter settings to use with this arrangement.

4 Basic Snapshot Exposures

1 OUTDOOR SNAPSHOTS

Daylight Only

YOUR SCENE

The following are the conditions under which more than half of all outdoor snapshots are made.

Light: Bright sunlight

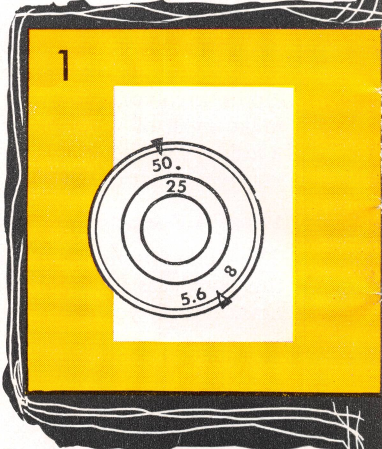
Subject: Posed in sunlight, lighted from the front, neither predominantly dark nor light in color, 12 feet or farther from the camera.

CAMERA SETTING for Kodachrome Film, Daylight Type

Shutter Speed: 1/50 second

Lens Opening: Between *f*/5.6 and *f*/8

Focus: 25 feet (Range of sharpness is approximately 12 feet to infinity at this setting.)



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2 OUTDOOR FLASH SNAPSHOTS

Daylight Supplemented by Flash

YOUR SCENE

When strong sunlight casts shadows on important detail, flash lightens and improves shadows.

Light: Bright sunlight

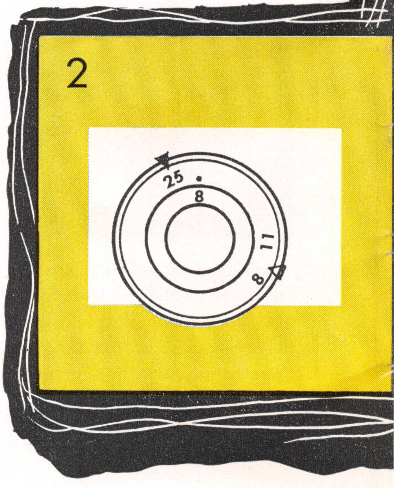
Subject: Posed in sunlight,* usually lighted from side or back. Neither predominantly dark nor light in color; 5 to 15 feet from camera.

CAMERA SETTING for Kodachrome Film, Daylight Type

Shutter Speed: 1/25 second

Lens Opening: Between *f*/8 and *f*/11

Flash Distance: 5 to 10 feet—No. 5B or 25B lamp
8 to 15 feet—No. 2B or 22B lamp



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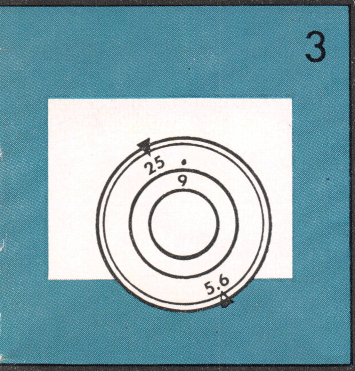
*When the subject is posed in deep shade, follow the instructions for Indoor Flash Snapshots.



INDOOR FLASH SNAPSHOTS 3

YOUR SCENE

Light: Little or none

Subject: Any subject in rooms of average-home size, with walls and ceilings of average lightness of color.

CAMERA SETTING for Kodachrome Film, Type F

Shutter Speed: 1/25 second

Lens Opening: f/11 at 5 feet or f/8 at 8 feet } No. 8 Lamp

f/16 at 6 feet or f/11 at 9 feet } No. 5 or 25 Lamp

CAMERA SETTING for Kodachrome Film, Daylight Type

Shutter Speed: 1/25 second

Lens Opening: f/8 at 6 feet or f/5.6 at 9 feet } No. 5B or 25B Lamp

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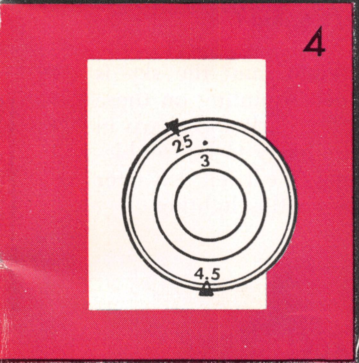


INDOOR FLOOD-LAMP SNAPSHOTS 4

YOUR SCENE

Light: Little or none, and when the more convenient flash cannot be used.

Subject: Usually still-life. At the lamp distance needed for snapshot exposure, live subjects may be uncomfortable. For lamp arrangements for time exposures see page 26.

CAMERA SETTING for Kodachrome Film, Type F

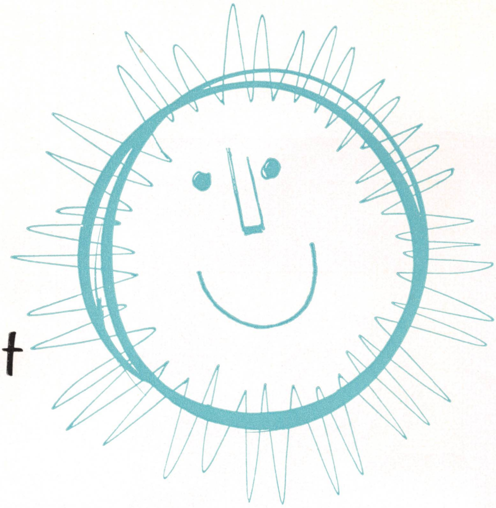
Shutter Speed: 1/25 second

Lens Opening: f/2.8 with two No. 2 reflector-type flood lamps at 4½ feet.

Use Kodak Light Balancing Filter No. 82A with all photoflood lamps.

The general text explains how to choose lens and shutter settings and flash and flood distances for other subjects.

In Sunlight

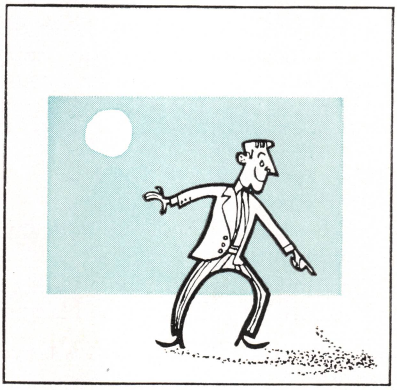


Sunny days can be grouped into two kinds: Bright Sunny Days and Hazy Sunny Days. You tell one from the other by looking at the sky and at the shadows that are nearby.

BRIGHT SUNLIGHT

1/50 between f/5.6 and f/8

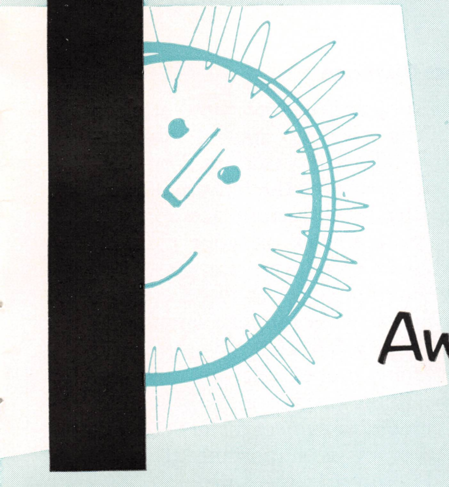
The sun is brilliant, and the sky is bright blue. Much squinting on these days! Shadows are dark and sharp in outline. They are likely to be troublesome in close-ups. We'll tell you later how to improve on this lighting.



HAZY SUNLIGHT

1/50 between f/4 and f/5.6

This is the best light for Kodachrome pictures. The sun's disk is bright but softened by a slight overcast and thin clouds. You can look at the sun without much discomfort. Shadows are light and soft in outline because of the diffusion and reflection of sunlight and skylight into the shadows.



Away from Sunlight

If your camera has a lens opening of *f*/3.5 or larger, you can handle the two conditions below at snapshot speeds. At smaller openings, you will need synchronized flash or time exposures.

CLOUDY BRIGHT

1/50 between f/2.8 and f/4

The sky is bright but overcast with white clouds. The sun's disk is obscured and there are no shadows. The subject must be lighted by plenty of sky overhead and in front. Remember, it's *Cloudy Bright*, not dull!

OPEN SHADE

1/50 between f/2 and f/2.8 (or 1/25 between f/2.8 and f/4)

You find this type of lighting when the sun is shining but does not strike the subject. The subject is shaded from the sun but must be lighted by a wide angle of unobstructed sky overhead and in front of the subject. As this angle decreases, you will need to use larger lens openings.

Variations from Basic Conditions

The two preceding pages outlined the basic camera settings for picture taking under four different types of illumination: 1. Sunlight, 2. Sunlight with Supplementary Flash, 3. Flash Indoors, and 4. Floodlight Indoors. If you are interested only in a good picture record of persons, places, and objects, these basic settings will take care of most picture situations. When you try for a more pictorial result by exploring a different lighting or viewpoint, you will need to vary from the basic setting to suit the new conditions. The following pages will explain how to handle these variations.

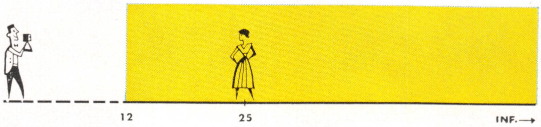
Subject Distance

Many a subject is best pictured at close range. You need no special information to handle this variation. You estimate or measure the distance and change the focus setting accordingly. With a rangefinder on your camera, this adjustment is even simpler.

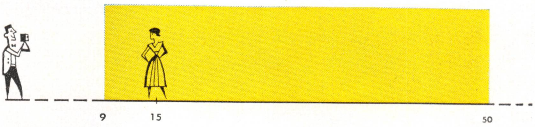
The diagram below shows the range of sharpness when the lens opening is set between *f*/5.6 and *f*/8—the basic setting for outdoor pictures. Notice that the range of sharpness is smaller as the camera-to-subject distance shortens. Accuracy is important at close range. It's safest to measure.

At any one of these distances, a change in lens opening also will change the range of sharpness: smaller lens openings increase it, larger lens openings decrease it. See diagram.

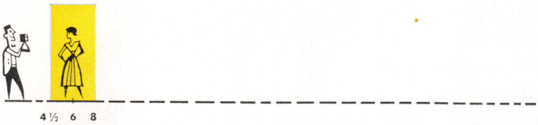
When your subject is more than 10 feet from the camera, and when you can use a lens opening of *f*/5.6 or smaller, you can focus your camera for ranges of distance instead of specific



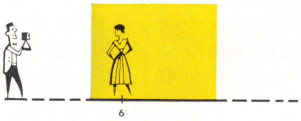
Focused at 25 ft. Lens opening between f/5.6 and f/8



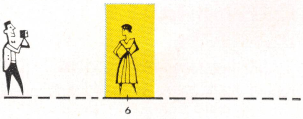
Focused at 15 ft. Lens opening between f/5.6 and f/8



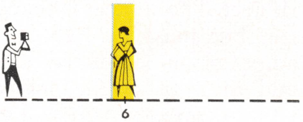
Focused at 6 ft. Lens opening between f/5.6 and f/8



Focused at 6 ft. Lens opening at f/16



Focused at 6 ft. Lens opening between f/5 6 and f/8



Focused at 6 ft. Lens opening at f/2.8

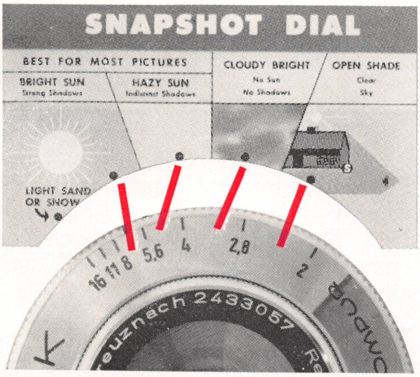
distances. This will be the case with most outdoor pictures.

When your subject is less than 10 feet from the camera, or when the lens opening is larger than *f*/5.6, you focus the camera for specific distances—frequently, measured distances. This will be the case with many indoor pictures.

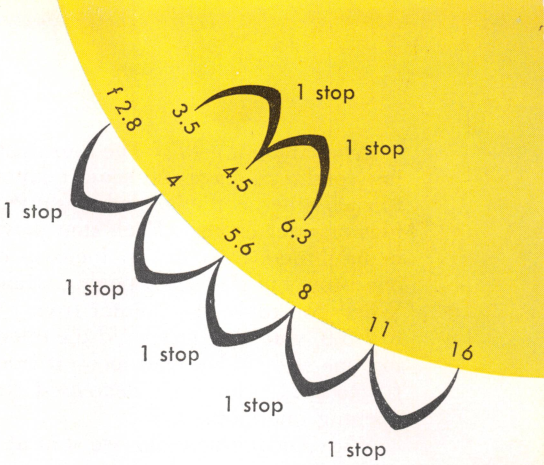
DISTANCE RANGE	SET FOCUSING SCALE AT
20 feet—Inf	25 feet
10—25 feet	15 feet
3½—10 feet	Measured Distance

When your subject is closer than 10 feet, it's a good idea to use a small lens opening. To do this, you need plenty of light. Here's where flash can help you out, particularly indoors.

While the size of the lens opening does affect the range of sharpness, you select a lens opening primarily to suit the lighting condition so that the film will be correctly exposed. This is our next subject.



The camera-shutter case has been inverted to show the direct relationship of lens openings to lighting conditions.



Outdoor Lighting

In judging the scene for the correct lens opening to use, you consider only three aspects of the scene:

1—Brightness of the light
2—Lightness of the subject
3—Direction of light on subject.

You can roughly identify all the variations in each of these three aspects as one of the following qualities:

Lighting	Bright, sunny day ● Hazy, sunny day Cloudy but bright Cloudy and dull
Subject Type	Average subject ● Light subject Dark subject
Direction	Front lighting ● Side lighting Back lighting

The basic setting, given on page 4, is based on the first quality of each aspect: bright, sunny day; average subject; front lighting.

1/50 between *f*/5.6 and *f*/8 ●

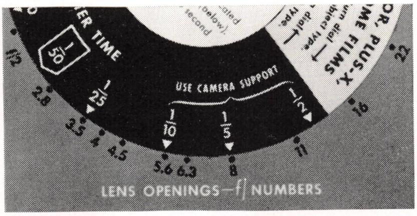
A change in any one of these qualities will call for a definite change in exposure setting. This change can be made in almost all cases by merely making the lens opening wider or smaller by a definite amount.

What amount is this? The four lighting conditions have the same relation to each other as the labeled lens openings on your camera. Each step down in brightness calls for an increase of one stop on the lens-opening scale. When you move the pointer from *f*/8 to *f*/5.6, you have *increased* the opening one stop. When you move it from *f*/8 to *f*/11, you have *decreased* the opening one stop.

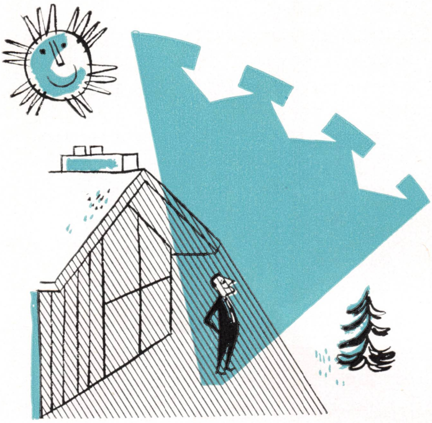
With Kodachrome film we start at a mid-point between the labeled openings. The shutter remains at 1/50.

Bright, sunny day	between f/5.6 and f/8
Hazy, sunny day	between f/4 and f/5.6
Cloudy but bright	between f/2.8 and f/4
Cloudy and dull, or Open Shade	between f/2 and f/2.8

The first two conditions are best for Kodachrome pictures. Under the other two, colors lose intensity and also become cooler. From here on we will ignore the cloudy, dull lighting condition in favor of open shade. Under cloudy, dull lighting, you seldom get satisfying pictures unless you use supplementary flash.



The Kodaguide Dial is set for open shade and shows the choice of settings which will give equal exposure.



Although the sun is shining, your subject is in the shade of a cast shadow. The subject gets its light from the blue sky overhead and in front.

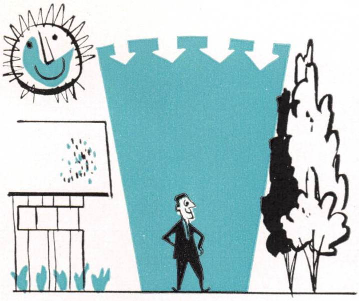
Don't worry if your camera does not have settings of *f*/4, *f*/2.8, and *f*/2. Equivalent exposures can be achieved at slower shutter speeds.

Cloudy but bright	1/25 between f/4 and f/5.6 (f/4.5)
Open shade	1/10 at f/5.6

Figuring equivalent exposures is easy when you use a Kodaguide Snapshot Dial. The dial gives the correct lens opening for any shutter speed, and vice versa.

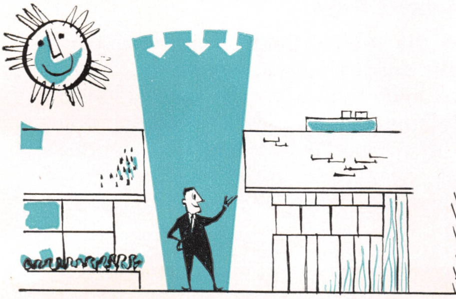
Direction

The lens-opening settings we've discussed so far are for front-lighted subjects. When the light is from the side or from behind the subject, the shadow side of the subject faces the camera

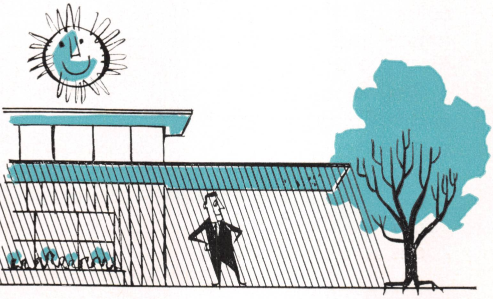


The arc of sky lighting the subject is reduced. Lens must be opened wider.

Overhead skylight is cut off by trees. This is no longer open shade.



The arc is still smaller. The lens must be opened still wider.



Porch roof cuts off overhead skylight. This is not open shade.

and is lighted less brightly than a front-lighted subject. Correct exposure then needs a wider lens opening.

On a bright, sunny day, make the lens opening a half-stop wider for either side or back lighting. If the *back-lighted* subject is posed at 12 feet or less from the camera, make it a full-stop increase because shadows become more dominant close up.

On hazy, sunny days, the shadows are lighter. On such days, give a half-stop increase for back-lighted subjects only. Hazy sun means soft sunlight, not low visibility from atmospheric haze.

On the brightest days, side or back lighting may be too contrasty for best results, even with the above lens-opening compensations. You can overcome this by throwing light into the shadows with a synchronized flash or with a reflector. We'll discuss this later on.

When the sun is not shining on the subject, there is no need to consider front, side, or back lighting. There is no strong directional quality to the light on cloudy but bright days, on dull days, or when the subject is in shade on bright, sunny days.

Shade is a difficult condition to judge for exposure. We can simplify judgment somewhat by distinguishing between two kinds of shade.

Open Shade is found in the shadow cast by nearby large objects. The sun is shining, but not on the subject. No tree branches, porch roofs, or similar objects overhang the subject. There must be a wide angle of unobstructed sky overhead and in front of the subject. Under these conditions, the lens opening is three stops wider than for a subject posed in the bright sunlight—1/50 between *f*/2 and *f*/2.8, or its equivalent; 1/25 between *f*/2.8 and *f*/4; 1/10 at *f*/5.6; etc. With smaller angles of unobstructed sky overhead, still wider lens openings are needed.

Deep Shade is found where the subject is shaded from overhead. The sun is shining, but not on the subject. There may be little or no sky visible to the subject. Naturally, still wider lens openings or longer shutter times are needed here.

In both open shade and deep shade, colors in the picture lose their brilliance and appear cooler and often bluish. You can correct this by using a flash lamp. A flash lamp also puts you back on your feet with regard to exposure settings. No guesswork is needed. The paragraphs on page 15, under the heading *Handling Shadows and Shade,* will tell you how to go about it.

Exposure Meters

Do you need an exposure meter? Since lighting in shade can vary so much that we can't give definite exposure settings, why not make really sure by using a meter? Well, a dependable exposure meter is not an inexpensive device. If you take all your pictures in sunlight, you can do without it. By following the exposure recommendations in tables and guides, you can feel certain of correct exposure. But there are conditions under which an exposure meter is a definite help. If you are looking for subjects under unusual lighting conditions, then a meter is a good investment.

No matter how expensive a meter you buy, it will not do all the thinking for you. It must be used correctly. Read carefully the instructions that the manufacturer packs with the meter.

In outdoor scenes on cloudy but bright days or dull days, there is a great difference in brightness between the sky and the foreground subjects. If you aim the meter incorrectly, its reading will be influenced too much by the sky. Your picture will be underexposed. Generally, a meter that reads reflected light (when pointed at the subject) should be pointed slightly downward to reduce this sky effect. A meter reading incident light (the mixture of skylight and sunlight falling on it) must be held so that the light striking it is of the same character as the light on the subject.

Subject Type

Is the subject light, average, or dark? We aren't referring now to the amount of light falling on the subject. We're talking about the dark or light clothing the subject is wearing, the darkness of foliage and grass, the lightness of sand and light-colored buildings. Ev-

LIGHT SUBJECTS

This class includes scenes in which the picture area of principal interest is dominated by light objects or surfaces. Distant scenery, light-colored buildings, and nearby people in marine, beach, and snow scenes are typical of this class.

IN BRIGHT SUNLIGHT

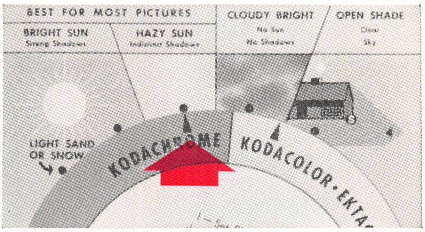
1/50 at f/8

ery scene contains a mixture of light, average, and dark surfaces. If the object of principal interest in the scene contains a greater amount of light surfaces, we call the subject *light*. If it contains more dark surfaces, we call it *dark*. The greatest number of scenes are average. The exposures given so far are for average subjects.

Adjusting for subject type will mean a shift to one-half a lens opening wider for dark subjects or one-half a lens opening smaller for light subjects. The Kodaguide Snapshot Dial takes care of the subject type in one setting of the dial.

Extra-Light Subjects fall into a special class. They are usually the product of several conditions: very light subjects in bright sunlight, under wide expanses of sky, and at medium and far distances. Such conditions are frequent in the South and Southwest. Expose them at one full lens opening smaller than for average subjects.

Where light subjects are common, the native may consider them normal to the area and therefore *average*. To the camera, they remain *light* subjects and should be exposed as such.



AVERAGE SUBJECTS

This class includes scenes in which the picture area of principal interest contains about equal amounts of light and dark objects or surfaces: gardens, houses, and nearby people in the more common surroundings. Use this class when in doubt.

IN BRIGHT SUNLIGHT

1/50 between f/5.6 and f/8

DARK SUBJECTS

This class includes scenes in which the picture area of principal interest is dominated by dark objects or surfaces: people in dark clothing, dark flowers, foliage, animals, and buildings. Subjects usually must be close to the camera to qualify in this class.

IN BRIGHT SUNLIGHT

1/50 at f/5.6

What It Boils Down To

Memorize the basic setting for an average subject front-lighted in bright sunlight:

1/50 between f/5.6 and f/8

This is your starting point from which you can estimate correct settings for all the most common situations.

1—Dark subjects need a half-stop increase in lens opening. Light subjects need a half-stop decrease in opening.

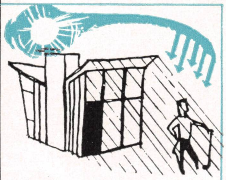
2—Steps down in lighting intensity (hazy sun, cloudy bright, open shade) need a full-stop increase in lens opening for each step.

3—Side- or back-lighted subjects in bright sunlight need a half-stop increase. Back-lighted close-ups need a full-stop increase. On hazy, sunny days, or amid light surroundings, only back-lighted close-ups need an increase—a half stop.

IN SUNLIGHT
at 1/50 second

		Bright Sun	Hazy Sun
Light Subject	Front-Lighted	f/8	f/5.6
	Side-Lighted	f/5.6-f/8	
	Back-Lighted	f/5.6	f/4-f/5.6
Average Subject	Front-Lighted	f/5.6-f/8	f/4-f/5.6
	Side-Lighted	f/5.6	
	Back-Lighted	f/4-f/5.6	f/4
Dark Subject	Front-Lighted	f/5.6	f/4
	Side-Lighted	f/4-f/5.6	
	Back-Lighted	f/4	f/2.8-f/4

AWAY FROM SUNLIGHT
at 1/50 second



	Cloudy Bright	Open Shade
Light Subject	f/4	f/2.8
Average Subject	f/2.8-f/4	f/2-f/2.8
Dark Subject	f/2.8	f/2

Shadows and Shade

The average snapshot is not a product of patience. You usually can't wait until the light is just right photographically. The picture must be taken now, before you or the subject matter moves on. So, you have to make the most of whatever light you have and do what you can to improve it.

If your subject is in bright sunlight, it will cast some kind of shadow. You can do one of three things to make the shadows less troublesome: 1—You can make them small and less conspicuous in the important parts of the picture; 2—You can expose for the shadows and let the bright areas shift for themselves; or 3—You can make them less dark, less contrasty.

1—Making the Shadows Smaller

Photograph the scene with the sun lighting it flatly from the front. This puts the sun behind you, the photographer. Most of the shadows then will be behind the objects of principal interest and will be less conspicuous in the picture. This is the reason you've found picture-taking instructions for the beginner stressing front lighting: "Stand with the camera so that sunlight comes over your shoulder and falls flatly on your subject."

For close-ups of people, front lighting in bright sunlight isn't much of a solution to the shadow problem. Your subject squints, and there are usually dark shadows in the eye sockets and under the nose and chin. So, you'd better use side or back lighting and fill in the shadows with supplementary light. You'll find instructions for this below, under *3—Making the Shadows Lighter*. Your pictures will then have an effect of greater third dimension, and the modeling on the subject will be more interesting.

2—Exposing for the Shadows

You do this only when shadow areas form a large part of the picture area and when the shadow includes the details of principal interest. The subject that satisfies these conditions is almost always a close-up.

When the subject is flatly lighted by bright sun, the camera settings are 1/50 second at between *f*/5.6 and *f*/8. When the subject is turned away from the sun, the detail in the shadows is less brightly lighted. You must then increase the size of the lens opening. This increase is one-half a stop—a shift to *f*/5.6. If the back-lighted subject is close to the camera, increase one full stop—1/50 second between *f*/4 and *f*/5.6. If the shadows are not lighted by plenty of skylight, you had better use an even larger opening.

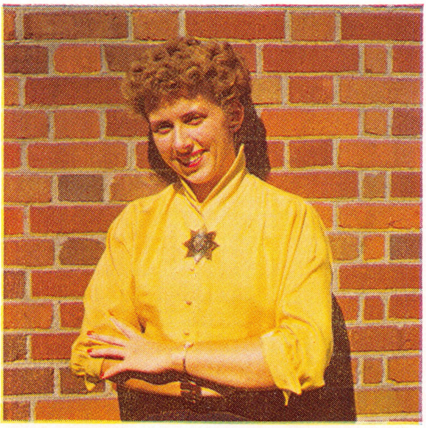
3—Making the Shadows Lighter

You can lighten shadow areas by using a supplementary flash to throw more light into them. This is the best way to handle shadows. Maybe it seems odd to use flash lamps outdoors in sunlight, but when you compare the results, you'll change your mind.

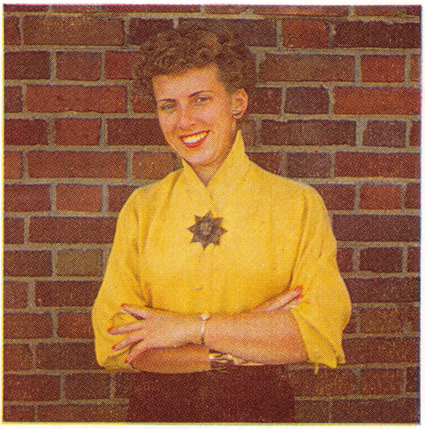
Your camera must be adaptable to a synchronized flash unit, a device that automatically flashes the lamp at the instant the shutter is wide open. Most recent cameras are designed to accept a flash unit. With this equipment, the procedure is simple.

The sun may light the subject from the front, side, or back. Nevertheless, you adjust the lens opening to a point halfway between *f*/5.6 and *f*/8, just as though you were going to make a snapshot of a front-lighted subject without flash. On a bright, sunny day, a shutter speed of 1/50 second would normally go with that lens opening. However, your camera instruction manual will tell you what shutter speeds you can use with flash lamps.

(*Continued on page* 18)

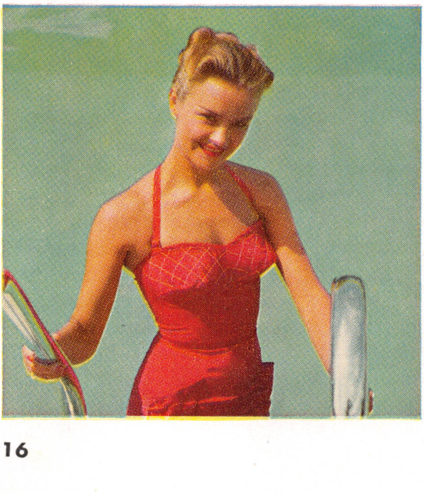


1—Exposure: 1/50 at a lens opening between *f*/5.6 and *f*/8. In pictures of people 15 feet or less from the camera, front lighting often causes strained expressions and harsh lighting on the face. This lighting is improved where surroundings are light enough to reflect light into the shadows.

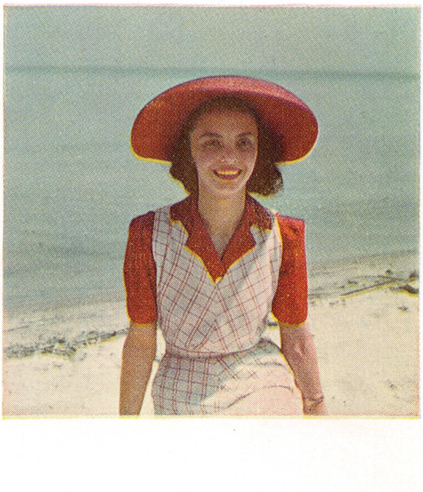


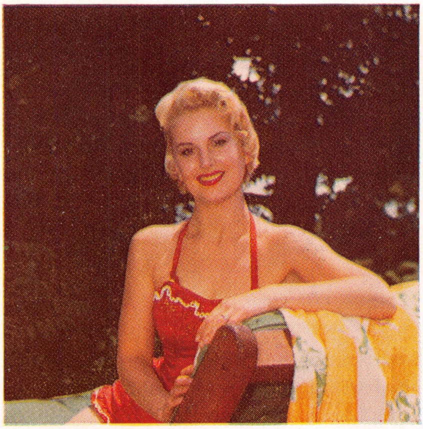
2—Posing the subject in open shade is one solution to better portraits. Facial expressions are more natural. Note, however, that colors are rendered softer and cooler. They can be warmed up by using a Kodak Skylight Filter over the camera lens. Exposure: 1/25 at *f*/3.5—and a steady hand.

3—Side lighting is good for portraits when the subject is in direct sunlight. Side light does not strain the eyes, creates a greater feeling of depth. The lens must be set half a lens opening wider—1/50 at *f*/5.6. The shadows in side lighting are best when light surroundings act as a reflector.

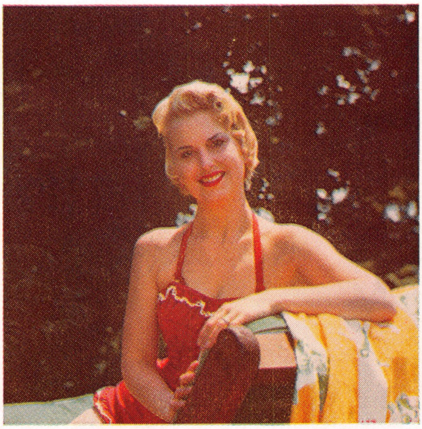


4—Watch out for brimmed hats! In bright sunlight they cast shadows on the face that turn out much darker in the picture than they appeared to the eye. Either remove the hat or use a reflector or supplementary flash. In this picture the beach sand acted as a reflector and saved the day.



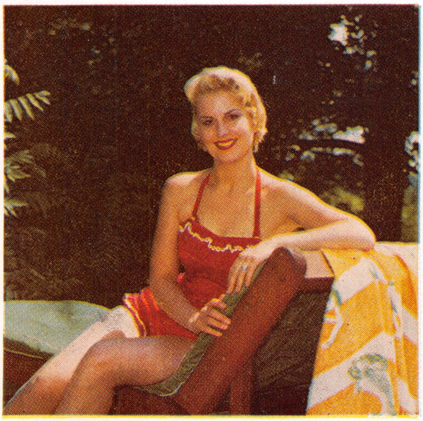


5—A No. 5B lamp was flashed 7 feet from the subject to fill in the shadows caused by back lighting. Flash at this short distance tends to eliminate the back-lighting effect and give the subject a cut-out appearance against a dark background. Exposure was 1/50 between *f*/5.6 and *f*/8.

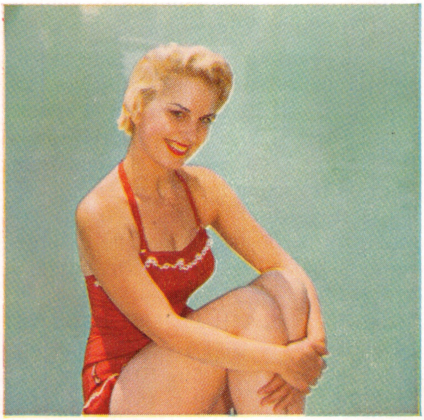


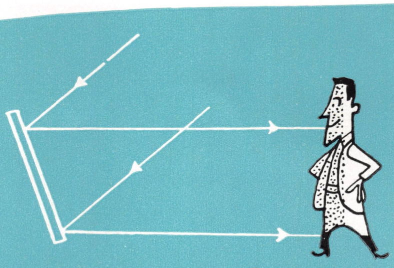
6—This is the same exposure setup as in No. 5, but a man's white handkerchief has been draped over the flash reflector to reduce the amount of shadow fill-in. This retains the back-lighted effect but adds enough light to give better modeling and cleaner color in the shadows.

7—The amount of shadow fill-in can also be reduced by flashing from a greater distance. With the flash unit mounted on the camera, this also means an increased taking distance. This illustration was made at the same exposure as that used in No. 5 and 6, but the distance was 10 feet.

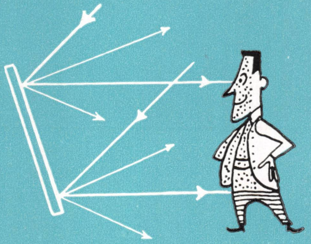


8—Here the subject is back lighted where the background is brighter. The brighter background relieves the cut-out appearance obtained in illustration No. 5, although the exposure is the same—a bare No. 5B lamp flashed at 7 feet from the subject at 1/50 between *f*/5.6 and *f*/8.

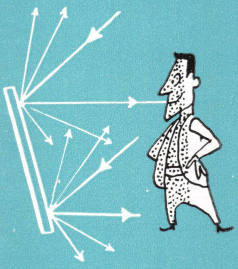




Mirror-type reflector



Aluminum-painted



Matte-surfaced reflector

(*SHADOWS AND SHADE, Continued*)

If your camera shutter was not designed to synchronize with No. 5B, 25B, 22B, or 2B flash lamps at speeds faster than 1/25 second, merely make the setting 1/25 second at a lens opening one stop smaller—between *f*/8 and *f*/11. Regardless of the setting, you make the exposure using the distance range shown in the following table.

FLASH LAMP	FLASH LAMP-TO-SUBJECT DISTANCE RANGE
5B, 25B	5 to 10 feet
22B, 2B	8 to 15 feet

Best balance between daylight and the light from the flash is obtained at the farther limits of the distance range. At the closer limits, the flash begins to eliminate the shadows entirely. This gives the subject a lighting that looks entirely different from that on the objects in the background—a good picture, but slightly out of this world. To avoid this at close range, stretch a clean, white handkerchief over the front of the flash reflector. This reduces the brightness of the flash.

Blue-coated lamps are recommended for exposing Kodachrome film outdoors. They provide light that approximates the color of daylight. Clear flash lamps may give light that is too orange for daylight-type color films.

Flash lamps aren't the only means of throwing added light into the shadow area. Light-colored surfaces nearby, but not necessarily in the picture area, will reflect light into the shadow side. However, make sure that the surface is white, or near-white. A definitely colored surface will throw *color* into the shadows and give the subject an odd appearance in the finished picture.

A usable surface can be the side of a building, sand, or water, or it can be a portable reflector made from a mirror, a chromium ferrotype tin, an aluminum-painted surface, a white cardboard, or some similar device. The portable reflectors above are listed in descending order of the amount of light they reflect.

The mirror or ferrotype tin reflects most of the light reaching it and can produce a pronounced fill-in effect. It is best, therefore, when the reflector must be placed at some distance from the subject. The aluminum-painted surface is best at a distance from the subject about four times the width of the reflector. White cardboard must be placed close to the subject. This limits its use to close-ups, of course, in order to keep the reflector out of the picture.

A trifle inconvenient, these ideas. You either have to carry a reflector or hunt out a natural one. It's easier to use synchronized flash.

Why All This about Shadows?

A good picture will have detail in both highlights and shadows. You can't leave this responsibility entirely to the film. To Kodachrome film, any scene is just a range of brightnesses from light to dark. It reproduces fairly long ranges of brightness with ease, provided you have used the correct lens opening and shutter setting for the lighting condition and subject type. With extreme ranges, it has trouble—something like the trouble a librarian with a six-foot arm stretch has in trying to pick a seven-foot-wide row of books off a shelf in one trip. Some of the brightnesses, at one end or the other, will not be picked up. Or, some at each end will be missed. The brightnesses beyond the film's reach will appear on the transparency as clear film on the bright end, or dense, degraded color on the dark end. How great a brightness range is OK? It depends on the kind of end product you want: transparencies or prints.

Color pictures are in two forms:

1—The film transparency which you see by the *light coming through it* from the back, projected on a screen or in a viewer. This is the picture you receive from the processing station.

2—The color print which you see by the light *reflected* from the opaque material on which it is printed. These are available from your dealer. Such prints when made by Kodak are in the form of either Kodachrome Prints or Kodacolor Prints.

The print cannot reproduce as great a brightness range as the transparency, because the print is viewed by reflected light. The darkest possible deposit on the print base reflects a fair amount of light. This has the effect of shortening the range of print brightnesses.

The print is made from the transparency. If the brightness scale of the scene is too extreme for the film, the transmission densities in the picture on the film will likewise be too extreme for the print. (Our librarian who picked up six feet of the seven-foot-wide row of books is handing them to another librarian with a five-foot arm stretch.) Each reproduction loses some of the brightnesses.

You will always find an extreme brightness scale in a subject posed partly in shade and partly in direct sunlight. You'll find it often, too, with side- or back-lighted subjects when the day is very clear and bright and the surroundings do not include light, reflective surfaces like sand, snow, light masonry, or water. In such circumstances, if the subject can't move to better light, the best way to get a good transparency that will permit the making of good prints is to use supplementary flash or an adequate reflector.

Not all sunlit scenes are this contrasty and not all contrasty scenes will need this treatment. In many cases, not all of the scene is important. If either of the extremes—high or low—in brightness are in unimportant parts of the scene, you won't mind if these parts appear too light or too dark in the transparency or print. You will be satisfied as long as these extremes do not occur together on the subject of principal interest.

How much of this technical material do you have to know? Very little. If you set your lens opening and shutter correctly, you can use the sunlight as you find it to make countless good Kodachrome pictures. The technical explanation is included merely to underline the warning to watch out for contrasty shadows in the picture area. This is particularly important if you want good prints made from the Kodachrome transparencies.

Over the Shoulder

How does a photographer go about figuring how to adjust his camera for a picture? Let's find one who talks to himself and listen to what he thinks about in the cases illustrated on pages 20, 21, 24, 25, and 28.

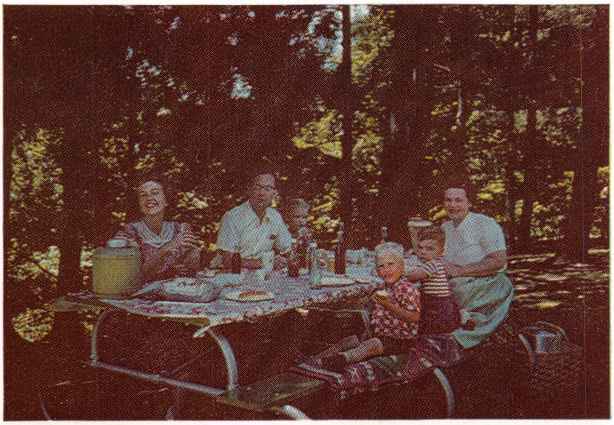
In scene A, the whole group is in deep shade—under trees and away from sunlight. But, just how deep is "deep" shade? This lighting may need a shutter time anywhere from 25 to 200 times longer than that used in sunlight. This is typical of the difficulties thrown in the way of the photographer on a picnic. A shady spot under the trees is a good place to spread out the food, but it's a poor place for pictures. Nevertheless, we take those picnic-table scenes—probably because it's the one time at a picnic when the group is together and fairly well immobilized.

But, what about that range of exposures? Leaving the lens opening between *f*/5.6 and *f*/8, the best shutter time will be somewhere in the range from 1/2 second to 4 seconds. This is one spot when a photoelectric exposure meter would be mighty handy. Not having one, I can be pretty sure of getting one satisfactory result by making three exposures—one each at 1/2 second, 2 seconds, and 4 seconds. This means that the group will have to hold still, and I'll need a tripod or some other firm prop for the camera. Having made deep-shade pictures before, I know that the colors in the finished picture will have a bluish cast (Illustration A). I can reduce this somewhat by placing a Kodak Skylight Filter over the lens before making the exposure. But, there is an easier and better way to make pictures in deep shade.

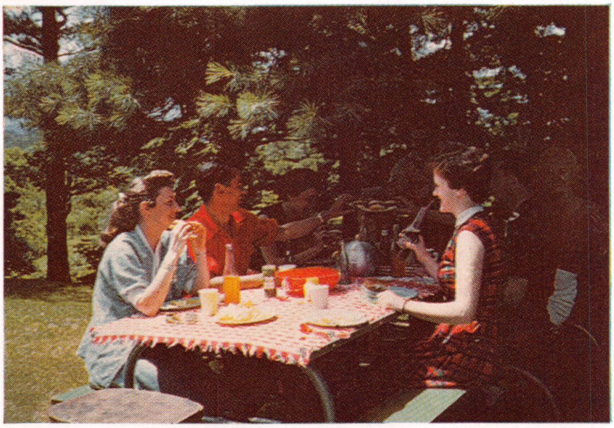
The easy way out—short of moving the picnic table out into the sun—is to use a flash lamp. With Kodachrome Film, Daylight Type, in the camera, I'll need a blue-tinted lamp. I'll base the exposure on the Flash Guide number alone. The level of daylight illumination is too low to consider.

In scene B, part of the group is in sunlight, and part is in shade. This lighting condition is found in many situations other than at picnics. For the subjects in sunlight, the exposure should be 1/50 second between *f*/5.6 and *f*/8. For those in shade, it's something like 1/2 second between *f*/5.6 and *f*/8. If I expose for sunlit subjects, the shaded subjects will disappear in the shadow. If I expose for shaded subjects, the sunlit subjects will bleach out. There is no good middle ground.

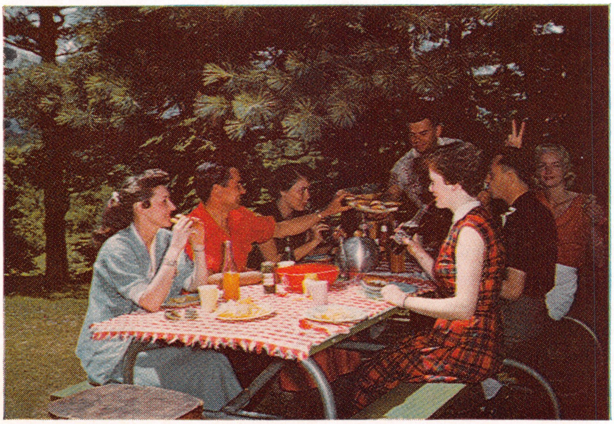
Best solution is to use a blue-tinted flash lamp to reduce the difference in illumination between the sunlit and shaded portions. An exposure of 1/50 second between *f*/5.6 and *f*/8 with a No. 5B lamp flashed at 12 feet will at least show the people in the shadow (Illustration C). If the trees weren't in the way, it would be better to shoot from the shaded end of the table so that the shaded subjects would get more of the flash.



A



B



C

Indoor Flash Pictures

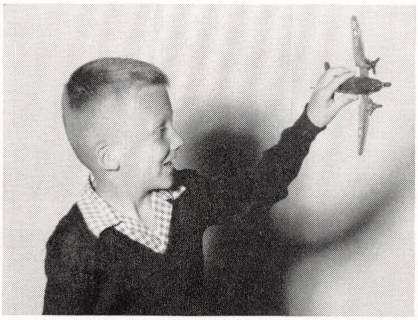
There is a correct type of flash lamp for use with each type of Kodachrome film: clear lamps for Type F, blue-coated lamps for Daylight Type. The number designations of blue-coated lamps bear the suffix letter *B*; for example, 5B, 25B. For indoor flash pictures, the best combination is Kodachrome Film, Type F, with clear flash lamps.

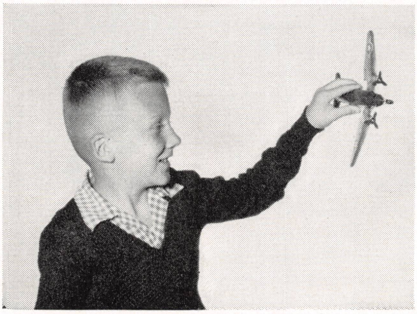
Of all the clear flash lamps, only the SM and SF always require a filter to correct the color of the light reaching the film. The filter for these lamps is the No. 82B. Without a filter, the colors in the picture will be warmer and yellower than they appeared in the scene. Some M2 lamps may also need a filter and the lamp carton should be checked for recommendations.

Synchronization

Check your camera and flash-unit manuals for the lamp-type and shutter-speed recommendations. This is important because synchronization needs split-second teamwork between shutter and lamp. You can't assume that you have a picture just because the lamp and shutter *seem* to go off together. The peak, or brightest portion, of the flash must occur at the precise instant the shutter is wide open. Some types of lamps peak more slowly than others. With some shutters, the maximum opening is reached later than with others. Consequently, some lamps will not synchronize with all shutters at all speeds. The recommendations will specify lamp type, shutter time, and any special shutter adjustment that may be necessary.

The lamp must receive an adequate electrical discharge from the batteries





When the flash unit is mounted on the camera, the subject is front lighted. This lighting is satisfactory but somewhat flat. The Kodak Data Book on Flash Technique explains other methods of lighting with flash.

When the subject is near a background, a sharp shadow outlines the subject, as shown in the illustration. This can be eliminated by moving the subject away from the background or by lighting the background separately with a photoflood lamp. This was done in the second illustration.

in order to flash at the correct instant. Old batteries should be suspect, even though they may have had little use. The Kodak B-C Flashpack solves this problem inexpensively by substituting a dependable battery-condenser power system. The B-C Flashpack fits any flash unit which accepts two "C" batteries end to end.

These paragraphs may give the impression that backing a long shot at a horse race is a surer thing than flash synchronization. To the contrary, the point we're making is: Use the correct lamp, the correct shutter time, and good batteries; then, you can't miss. If you can set your shutter for a 1/25-second exposure, use that setting whenever you are in doubt about lamp type or shutter manipulation. That works in nearly all cases. But you can't use SM or SF lamps with Kodak Signet Cameras No. 180400 and earlier.

An SM or SF lamp has a special advantage for some cameras. Its flash is very short. Even though the shutter is set at a slower speed, the flash gives the effect of a shutter time of 1/200 second when it is the sole or major light source. This use of a slow shutter speed and short flash compensates for possible faulty synchronization from poor battery conditions or contacts.

Flash Exposure

Correct exposure with flash is a matter of simple arithmetic. You divide a Guide Number by the distance from lamp to subject. Each type of flash lamp has a Guide Number for each shutter speed. If you use a Kodaguide Snapshot Dial, you don't even need to divide. It does it for you. For the arithmetic lover, a table of Guide Numbers is given here.

Example: You are using a No. 5

FLASH EXPOSURE GUIDE NUMBERS

Film	Shutter Speed	M2†	SM* SF*	5* 25*	2+ 22+	6* 26*
Kodachrome, Type F, 135 and 828	1/25	50	40	95	140	
	1/50		40	85	130	90
	1/100		35	75	110	55
	1/200		30	60	85	
				5B* 25B*	2B+ 22B+	6B* 26B*
Kodachrome, Daylight Type, 135 and 828	1/25			50	75	
	1/50			45	65	45
	1/100			40	55	28
	1/200			30	45	

†In 3 to 4-inch polished reflector.
*In 4 to 5-inch polished reflector.
+In 6 to 7-inch polished reflector.
With satin-finished reflector, use ½ lens opening larger.
With SM or SF lamps, use of a Kodak Light Balancing Filter No. 82B is required.

lamp for Kodachrome Film, Type F, in a 4- to 5-inch polished reflector. You want to set the shutter at 1/25 second. The Guide Number is 95. If the distance is 9 feet, the lens opening is 95 divided by 9, or about *f*/11.

This is all you need to know for simple flash photography. If you're interested in using a flash that is not mounted on the camera, or if you want to use more than one flash and get different effects, get a copy of the Kodak Data Book *Flash Technique*. It will put you in the expert class.

How You Go About It

You have the correct flash unit and lamp for your type of camera and shutter. The picture-taking steps are then:

1—Insert lamp into reflector.

2—Pick the camera-to-subject distance that will give you the picture you want.

3—Focus for that distance.

4—Set the shutter time and lens opening (Guide Number divided by distance).

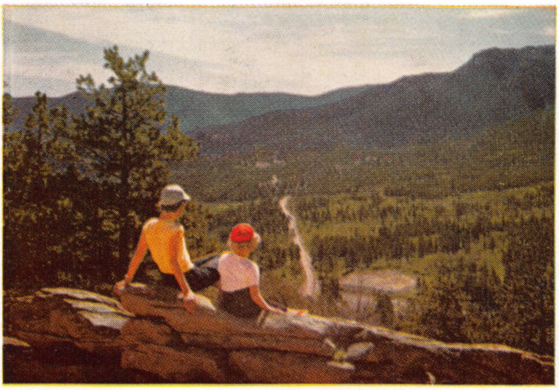
5—Snap the picture.

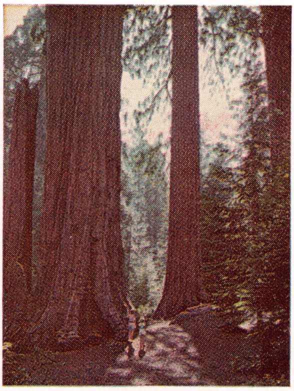
(OVER THE SHOULDER, Continued)

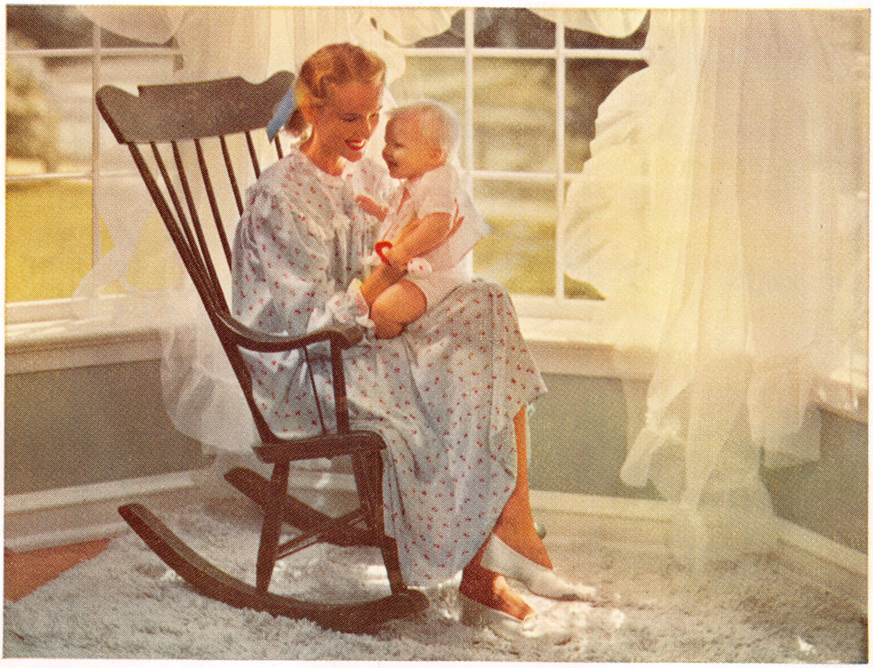
I've stood on a ledge like this before and been impressed to the point of taking a picture or two. No exposure problem here—1/50 second between *f*/5.6 and *f*/8. But, the finished picture was disappointing. This time, I'll back away from the edge and let the rock foreground and the children establish perspective. Now the picture will show that it's a valley scene shot from a height. The hats and blouses add nice touches of color, too. Since it's the scene that prompted the photo, I'll have the children look into the valley—not toward the camera. I can snap their portraits any time.

No one—unless they've seen them—will believe that those sequoias are *that* big. So, I'll get a couple of people into the scene for comparison. Usually you have to hunt for them in a picture like this.

Biggest problem here is the lighting. Bright sunny days make pictures next to impossible because the scene is too contrasty. Hazy or cloudy bright days like today are best—light is reflected and diffused into the shadows so that deep shade isn't so deep. In this scene, it's so far up to the foliage, it's sort of a special case. An exposure of 1/50 second at *f*/3.5 should be about right.







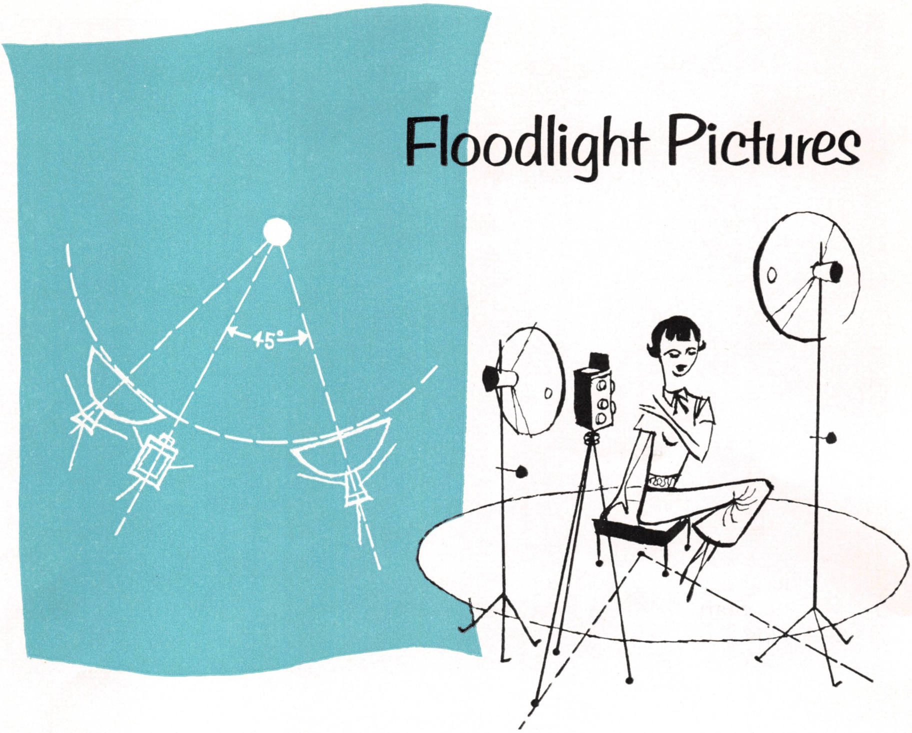
Mother and baby sitting in a sunlit bay window make an eye-catching scene. To someone who hasn't flubbed this type of lighting before, the scene looks fairly well lighted. The eye can look into the shadow and see detail, but to the camera's eye there is too great a brightness difference between the shadow side and the surfaces that face the light. Looks like I'll need another one of those blue-tinted flash lamps to help reduce this difference. Blue-tinted lamps, like No. 5B and 25B, are used with Kodachrome Film, Daylight Type.

First, I'll adjust the lens and shutter for the sort of light falling on the subject from outdoors. This is a hazy sunny day, so the exposure for the sunlighted portions is 1/50 second between *f*/4 and *f*/5.6 (*f*/4.5). If this shutter didn't synchronize at 1/50 with No. 5B or 25B lamps, I could use 1/25 second with an opening between *f*/5.6 and *f*/8 to get an equivalent exposure.

At 1/50 second, the flash guide number for a No. 5B or 25B lamp is 45. Since I'm using *f*/4.5, I divide 45 by 4.5 and get 10. A flashing distance of 10 feet will eliminate the back-lighted effect and make the subject appear front-lighted from inside the room. So, I'll hang a clean white handkerchief over the reflector. This will also make the flash highlights less shiny and the whole lighting effect more as it appeared to the eye.

In the illustration shown here, two flash lamps on extension cords were used in order to distribute the flash fill-in widely and to avoid reflections of the flash in the window panes.

Floodlight Pictures



For pictures by photoflood lamps, there's a choice of films. If you plan to do a great deal of snapping by flood, use Kodachrome Professional Film, Type A, which is designed especially for this kind of illumination; if you will be switching back and forth between flash and flood, use Type F.

On this page we are assuming that you have Type F film, want to use photofloods, and have a No. 82A filter over your lens.

Photoflood Arrangement

Use two No. 2 photofloods in floodlamp reflectors, or use two reflector-type photofloods. The latter have a built-in reflecting surface.

Arrange the lights as shown in the diagram. Both lamps are at the same distance from the subject, one lamp near the camera-to-subject axis, the other at about a 45-degree angle to the axis. This unbalanced lighting is usually more desirable than flat lighting. The picture gives a better showing of volume and depth in the subject.

The Main Light controls the location of the highlights that produce modeling. The Fill-In Light lightens the shadows caused by the Main Light. You can see the effect clearly if you switch on each light alone, first one and then the other.

The heights of the lamps will depend on where you want the highlights and shadows. If the subject is a person, the face is of primary interest. You want highlights and shadows where they will best define the features. So, you beam the Main Light at the subject from a height somewhat higher than the subject's head. This throws shadows under the brows, the nose, the cheekbones, and the jaw. You place the Fill-In Light so it lightens these shadows to a degree which best defines the contours of the face. You achieve this effect when the second lamp is about level with the subject's face. Although this lighting arrangement is prescribed for portraits, it works for other subjects, too.

Lamp Distance

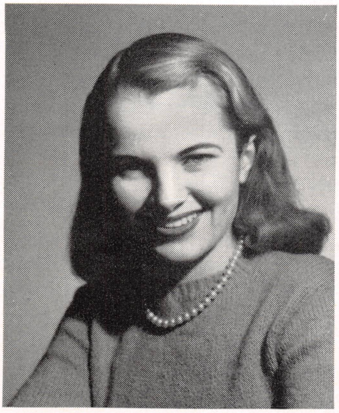
The basic setting given on page 5 was 1/25 second at *f*/2.8 for two No. 2 photofloods placed 4½ feet from the subject. When your subject is a person, an increase in this distance will prove more comfortable. Every time you increase the lamp-to-subject distance by approximately 50 percent, you will need a lens opening one stop wider. As an alternative, you can double the length of time the shutter stays open. Starting at 3½ feet, the following distances are related in intervals of one stop: 3½, 5, 7, 10, 14, 21 feet. An exposure table is given on page 33.

Background Shadows and Reflections

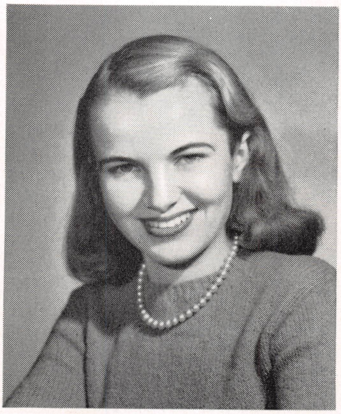
Photofloods cast strong shadows. If the subject is close to the background, these shadows will show on the background in the picture. This can be minimized by raising the lights high to cast the shadows down behind the subject.

You can also avoid objectionable shadows by posing your subject away from walls or upright surfaces. However, as you move the subject away from the background, the background becomes darker in the finished picture. If this is undesirable, you can hide a photoflood behind your subject so that its light is directed onto the background.

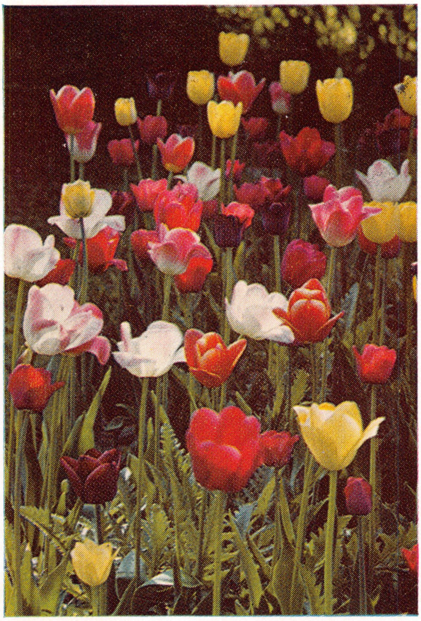
Watch out for shiny surfaces that will reflect light into the lens: windowpanes, mirrors, spectacles, and highly polished surfaces. You can check for them by looking at the scene with your eye close to the camera lens. A shift in position of either the subject, the camera, or the lights will usually correct any of these reflections.

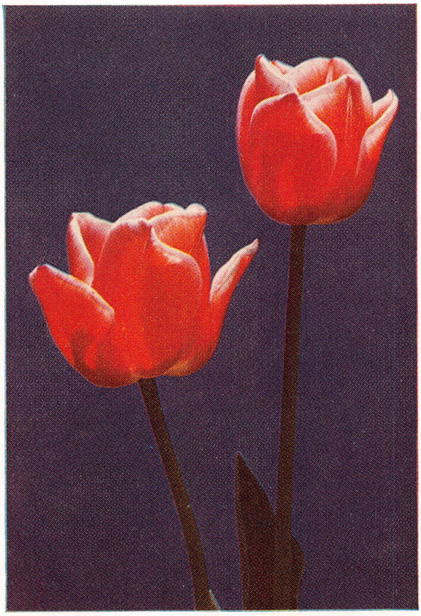


The Main Light gives roundness and shape to the face. Because this lamp is adjusted high, it casts eye, nose, and chin shadows downward and to one side.



The job of the Fill-In is to lighten the shadows cast by the Main Light. The two lights together place highlights and shadows where they best define the shape.





(*OVER THE SHOULDER, Continued*)

I could take a general shot of the tulip bed and let it go at that, but I'd like to get some size in the blooms.

Guess I'll try a five-foot focus. At this close range, part of the bed will be out of focus. I'll use the smallest lens opening to get a greater range of sharpness, but then I'll need to make a time exposure on a tripod. My Kodaguide Snapshot Dial shows that hazy sunlight requires an exposure of 1/2 second at *f*/22. I'll pick a back-lighted view because this lighting gives the tulips a translucent quality and makes them stand out from their background. Need half a lens opening wider for the back lighting here: 1/2 second between *f*/16 and *f*/22 (Upper).

Or, I can make this flower picture by singling out a couple of blooms and propping a colored cardboard behind them. This gets rid of the out-of-focus background. Now, I can move in close with a Kodak Portra Lens 2+ over the camera lens and get big images (Lower). For even larger images, I can use a Portra Lens 3+ or a combination of Portra Lenses. However, if I use my Portra Lens 2+ and focus the camera lens at infinity, I can take the picture at a distance of 19½ inches.

With Portra Lenses, you focus at one distance, work at another. A table of focus settings and working distances is packaged with each Kodak Portra Lens, but I have a simpler approach. I attached a string to the ring that holds my Portra Lens 2+. I tied a knot in the string 19½ inches out from the lens. This is the working distance when the camera is focused at infinity. To take sharp close-ups, I stretch the string in front of the lens until the knot is at the subject, drop the string, and snap the picture. My finder doesn't correct for parallax. In close-ups with a 2+, the top 1/6 of what I see in the finder will be cut off. I tilt the camera up accordingly.

Sharp Pictures

Camera Steadiness

One of the most frequent causes of fuzzy pictures is movement of the camera when pressing the shutter release. Here are some tips which will help you avoid this type of fuzziness.

1—Use a shutter time of no more than 1/50 second unless you have good reason for using a longer time.

2—Stand firmly, with feet separated.

3—Hold the camera with both hands, bracing it against your cheekbone or against your thumb wedged between the camera back and your cheekbone.

4—Press the shutter release slowly and evenly. You can't hurry the shutter by the speed with which you press it. It releases at a certain point in the thrust of the exposure button. The speed at which it opens and closes is fixed by the shutter setting.

5—Give yourself the mirror test.

Action Pictures

Nearly all of the specimen exposures on the preceding pages recommend a shutter speed of 1/50 second. Most people can hold a camera steady enough at this speed to avoid blurring the picture. If you have a steady hand, you can use 1/25 second when you need the slower speed. For still longer exposures, you must use a tripod or some other firm camera support.

So far, these exposures are all for a subject that stays put. But all life is not vegetable or mineral; our energetic youngsters, active friends, and frisky pets aren't always rooted to the ground. Sometimes we have to catch them "on the wing." Yet, they must be sharp in the picture and, at the same time, properly exposed.

Every movement of the subject means a movement of the image on the film. To get a sharp picture, we have to keep the image movement so slight that it is not apparent in the print. We do this by using a shutter speed to fit the action of our subject. The shutter speed depends on:

1—How far away the subject is.

2—In what direction the subject is moving with respect to the camera.

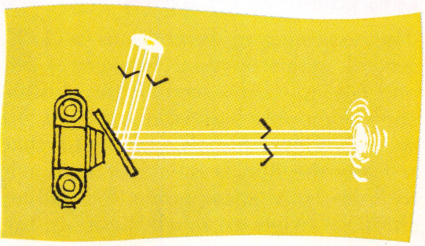
3—How fast the subject is moving.

Distant movement means less image movement on the film than when the subject is close.

Movement directly toward or away from the camera means less image movement on the film than movement across the camera axis.

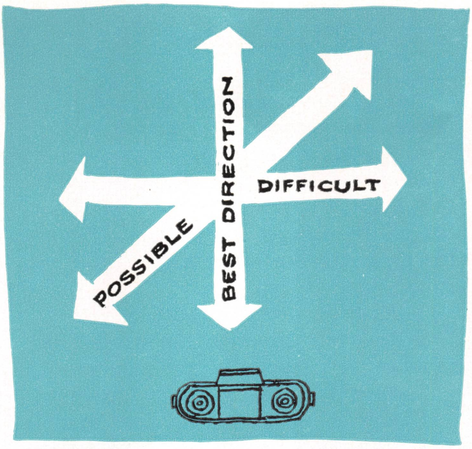
This means that you can photograph fast movement most easily when it is distant and when it is moving toward or away from the camera.

Uniform movement is easiest to record sharply. Parades, races, street traffic, boats, and similar subjects are



MIRROR TEST

Fasten a small mirror to the front of the camera. Direct a beam of light toward the mirror from a distance of about 10 feet. The light source can be a flashlight or a slide or movie projector. Hold the camera in picture-taking position and so that the beam of light strikes the mirror and reflects a spot of light on the wall opposite you. Practice pressing the shutter release until you can do it without causing movement in the spot of light.



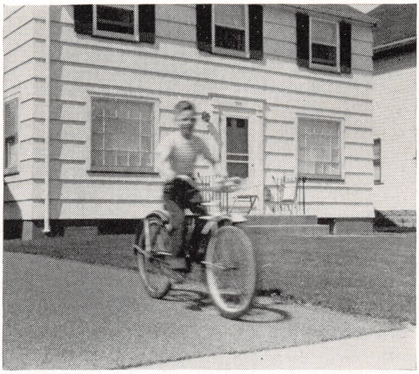
in this class. In some activities, movement is erratic. Body, arms, and legs may be moving in different directions and may change direction suddenly. However, there are usually moments of pause, at the beginning or end of the movement, during which you have the best chance for sharpness. Try to anticipate these pauses, and play safe by using as fast a shutter speed as conditions permit.

Lens Openings for Action

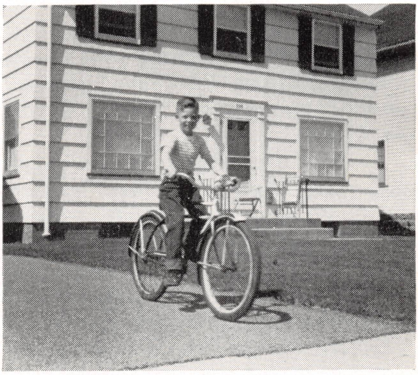
The exposure in bright sun is 1/50 second at an opening between *f*/5.6 and *f*/8. At 1/100 second, the shutter stays open only half as long as at 1/50 second. Consequently, the light that reaches the film is only half as much as it needs. A lens opening that will let through twice as much light as the former opening will correct the exposure. The opening that will do that is *f*/4.5—between *f*/4 and *f*/5.6.

When you halve the length of time the shutter is open, you must double the area of the lens opening to keep the same exposure. You increase one in the same ratio that you decrease the other.

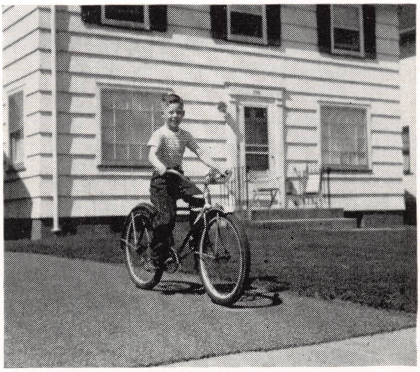
The Kodaguide Snapshot Dial is most helpful when camera settings must be changed while the same film exposure is maintained.



Diagonal motion at 1/50 second



Diagonal motion at 1/100 second



Diagonal motion at 1/200 second

Developing and Printing

Kodachrome pictures are at their best when you do the following: 1—Expose the film within a reasonably short time after loading it into the camera, and 2—Send it for processing immediately after making the final exposure.

Processing is handled through your regular Kodak dealer. Standard-size 24x36-mm and 28x40-mm transparencies are returned to you mounted in 2-inch-square cardboard mounts suitable for viewing by projection onto a screen or in any of several other viewing devices.

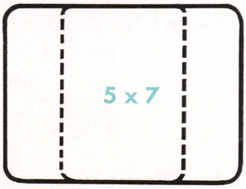
Prints

You can get two kinds of color prints made by Kodak: Kodachrome Prints and Kodacolor Prints. Kodachrome Prints are made directly from the transparency to the print material. Sizes are: 2¼ by 3¼ inches (2X Print) and 3 by 4⅜ inches (3X Print). A 3X Print from a stereo slide measures 3 by 3⅜ inches.

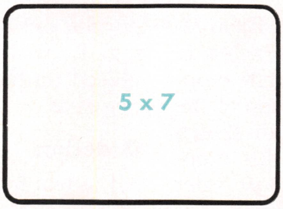
To obtain Kodacolor Prints from Kodachrome transparencies, intermediate 2¼ by 3¼-inch Kodacolor negatives are made. The prints are made from these negatives and are 3½ by 5 inches in size, including borders.

Kodacolor Prints are lower in price than Kodachrome Prints. Hence, you can save an appreciable amount when you want several prints of the same picture. There is no saving, however, when you order only one print, because a charge is made for making the intermediate negative.

MASKING FOR ENLARGEMENTS



135 and Stereo



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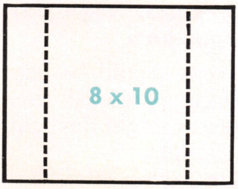
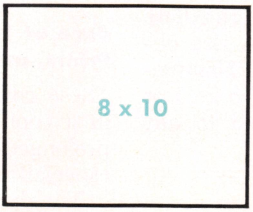


135 and Stereo



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In making 5x7- or 8x10-inch Kodachrome Enlargements, it is necessary to crop a little of the picture from one dimension. The outlines at left show the approximate areas used in enlarging from 35mm (24x36mm), 828 (28x40mm), and stereo (23x-24mm) transparencies. Broken lines show the stereo area.

The outlines can aid you visualize the cropping of the finished print. Place the page against a bright window or over an electric light to obtain some translucence. Then place the transparency on the page, over the outline, so that the outline becomes visible through the transparency.

Actual size of a Kodachrome Print 3X, made from a 135 transparency.

Kodachrome and Kodacolor Enlargements

Standard-size Kodachrome Enlargements are 5 by 7 or 8 by 10 inches in size. These print sizes necessitate cropping a little from one dimension of the slide. The approximate areas are shown on the preceding page. If this cropping is not acceptable, you must order a more expensive Kodachrome Enlargement, Special Size—5 by 7¼, 7 by 10, 5 by 5, or 8 by 8 inches.

When you have an intermediate Kodacolor negative, you can also obtain a 5 by 7-inch Kodacolor Enlargement from the entire negative area or from a selected area masked to one of the following sizes:

1½ by 2⅛ inches
1⅛ by 1⅝ inches

A 5 by 5-inch Kodacolor Enlargement can be made from an area masked to 2¼ by 2¼ or 1⅝ by 1⅝ inches. Such a portion must be masked by surrounding it with opaque masking tape placed on the base (shiny) side of the negative.

Ordering

All orders for duplicate transparencies or for prints and enlargements should be placed with your local photographic dealer.

Care of Transparencies, Negatives, Prints, and Enlargements

These color materials should be kept in a cool, dry place, protected from prolonged exposure to bright daylight, especially direct sunlight.

The dyes used in Kodak color films,

prints, enlargements, and duplicates, like other dyes, may, in time, change. These products therefore will not be warranted against any change in color.

Color films should not be left in cameras for long periods of time.

These materials will not keep well in the tropics without special protection from heat and humidity.

Slides and Filing

If you live in the Temperate Zones—and that covers most of the world's snapshooters—you have no special slide storage problem as long as you keep them out of the basement, the attic, and away from heating equipment.

A slide file box is helpful in many ways. It prompts you to weed out second-bests and to organize the slides in a logical story-telling sequence. You may even find yourself filling in the gaps by making a copy of the map showing the vacation itinerary, making close-ups of curios and mementos brought back, or making title slides. With slides in good order in a file box, a slide showing for friends is not marred by an interspersion of slides from other times and places, nor by a delay while you hunt for a particular scene. You can keep your slides in convenient, indexed sequence in the Kodaslide Flexo File, Kodaslide Ready File, and Kodaslide Compartment File.

Mounting Prints and Enlargements

Kodak Thermount Tissue is recommended for mounting Kodachrome Prints and Enlargements and Kodacolor Prints. This material can be used at a lower temperature than the regular mounting tissue. Excessive heat must be avoided because it may affect the dyes. Kodacolor Enlargements should not be mounted by any process involving heat.

Kodacolor Prints and Enlargements can be mounted with Kodak Rapid Mounting Cement. Neither rubber cement nor pastes containing penetrating solvents or water should be used.

DAYLIGHT WITH SUPPLEMENTARY FLASH

In bright sunlight, adjust shutter to 1/25 second at lens opening between *f*/8 and *f*/11 and flash the lamp within the following lamp-to-subject distance ranges:

No. 5B, 25B	**5-10 feet**
No. 2B, 22B	**8-15 feet**

When outdoor lighting conditions are poor, as in deep shade or on cloudy dull days, flash can be used as the principal light source. Ignore the daylight and base your exposure on the Flash Exposure Guide Number alone. Guide Numbers are given in the table on page 23.

PHOTOFLOOD EXPOSURE WITH KODACHROME FILM, TYPE F, and lamp-to-subject distances indicated (in feet).

USE KODAK LIGHT BALANCING FILTER NO. 82A

Shutter Speed (in seconds)	LENS OPENINGS							
	f/2	*f*/2.8	*f*/3.5	*f*/4	*f*/4.5	*f*/5.6	*f*/6.3	*f*/8
1/50	4							
1/25	6½	4½						
1/10	10	7	5½	5	4½			
1/5	14	10	8	7½	6½	5	4	
1/2	22	16	13	11½	10	8	7½	5½

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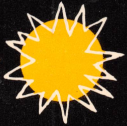


DAYLIGHT

SNAPSHOT EXPOSURE

Kodachrome

POCKET EXPOSURE GUIDE

FLASH

FLASH EXPOSURE

● The lens openings in the table are based on a shutter speed of 1/25 second. The row of figures in the diagram are labelled in feet. They represent distances from flash lamp to subject. Opposite each listed flash lamp is a series of lens opening numbers which are related to the scale of distances. The vertical red lines are distance lines and aid in finding the approximate lens opening to use at any of the distances.

Example: When a No. 5 lamp is used to light a subject 8 feet from the lamp, the diagram shows that the lens opening should be *f*/11.

		DISTANCE IN FEET	2		4		6		8		10		12		14		16
CLEAR LAMPS	Type F Film	M2*		*f*/11		8		5.6			4				2.8		
		No. 8†		*f*/16		11		8			5.6				4		
		No. 5, 25†					*f*/16		11				8				5.6
		No. 2, 22††							*f*/16				11				8
BLUE	Dayl't Type	No. 5B 25B†			*f*/11		8			5.6			4		3.5		

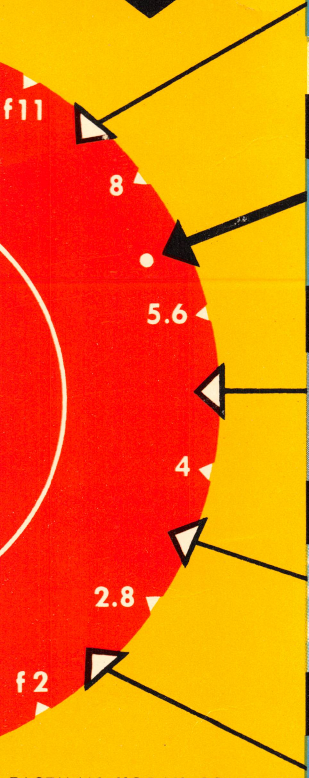
*3-inch polished reflector; Kodak Wratten Filter No. 81.

†4- to 6-inch polished reflector.

††6- to 7-inch polished reflector.

at 1/50 shutter speed set lens at opening indicated by lighting condition.

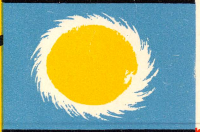
● Lens openings are for average subjects front-lighted in sunlight conditions. Light subjects may need an adjustment to a half a lens opening smaller. When the subject is side or back lighted, adjust to a half a lens opening larger. When closeups are back-lighted, use a full lens opening larger.



BRIGHT SUN ON SAND OR SNOW

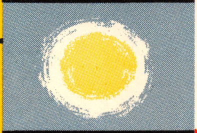
The sky is clear. Surroundings are light in color and reflect light strongly. When subjects are near camera, increase the lens opening one half stop to *f*/8.

BRIGHT SUN



A bright sun, clear sky condition in the more common surroundings comprised of approximately equal areas of light, average, and dark color. Shadows tend to be dense.

HAZY SUN



The sun's disk is bright but is softened by a thin overcast that diffuses the light. You can look at the sun without much discomfort. Shadows are light and soft in outline.

CLOUDY BRIGHT

The sky is bright but is overcast with white clouds. The sun's disk is obscured, and there are no shadows. There must be plenty of sky overhead and in front of the subject.

OPEN SHADE

The sun is shining but the subject is shaded from the sun by a nearby large object. Subject must be lighted by a wide angle of clear, unobstructed sky overhead and in front.

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